PATENT

BEFORE THE UNITED STATES PATENT AND TRADEMARK OFFICE
BOARD OF PATENT APPEALS AND INTERFERENCES

In re application of:	:	
PAUL R. HART	:	Group Art Unit: 1723
Serial No.: 10/719,567	:	Confirmation No.: 3547
Filed: November 21, 2003	:	Examiner: JOSEPH W. DRODGE
For: REMOVAL OF WATER	:	Docket No.: 194-27710-USCP
SOLUBILIZED ORGANICS	:	Date: January 14, 2008

REPLY BRIEF FOR APPELLANTS (37 CFR §41.41)

MS Appeal Brief - Patents
Commissioner for Patents
P. O. Box 1450
Alexandria, Virginia 22313-1450

Sir:

Appellants hereby submit their Reply Brief on appeal from the decision rendered by the Examiner finally rejecting claims: 1-4, 6-7 and 10-18 in the office action mailed May 16, 2007 (OFFICE ACTION), in furtherance of the Notice of Appeal filed July 16, 2007, the Appeal Brief filed September 13, 2007 and in response to the Examiner's Answer of November 15, 2007.

No fee is believed to be required for the entry of this Reply Brief. However, if it is determined that a fee is necessary, the Commissioner is authorized to charge any additional fees required for this communication to Deposit Account 02-0429 (194-27710-USCP Baker Hughes Incorporated).

The final page of this brief bears the attorney's signature.

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This Reply Brief contains these items under the following headings, and in the order set forth below (37 CFR §41.41):

SUBSTITUTE APPENDIX A – CLAIMS ON APPEAL

In preparing the instant Reply Brief, the Appellant noticed an inadvertent error in "Appendix A – Claims on Appeal" filed on September 13, 2007 with the Appeal Brief. Independent claim 15 inadvertently did not contain the phrase "the weight ratio of AHA to anionic polymer in the composition ranges from over 50:1 to 10,000 to 1" at the end of the claim. Thus, the Appellant is respectfully submitting herewith a Substitute Appendix A – Claims on Appeal at the end of the Reply Brief with the correct, accurate version of claim 15. The Appellant regrets any confusion this inadvertent error may have caused.

FURTHER ARGUMENTS

The Appellant would like to briefly address the following points made by the Examiner in the Examiner's Answer.

1. Cationic Demulsifier is Present when Anionic Demulsifier Added

At the end of page 8 of the Examiner's Answer, the Examiner notes: "***This*** [an anionic polymeric demulsifier] ***would have been an obvious selection of demulsifier for the Bellos process, since use of an anionic polymeric demulsifier is shown to result in separated treated water phase, having an environmentally permissible very low degree of contamination of residual oily contaminants, which is lower than what results from use of the other well known types of demulsifiers, without using anionic polymeric demulsifiers (see column 1, lines 21-50 of Augustin for such explicit motivation)***."

The Appellant does not agree with an anionic polymeric demulsifier being "the obvious selection" in the Bellos, et al. compositions for reasons already established in the Appellant's Brief filed September 13, 2007. Further, however, even if the Examiner's statement quoted above were true, a cationic emulsion breaker (demulsifier) would still ultimately be present when the anionic polymeric demulsifier is employed – the Examiner in the first paragraph on this same page, page 8, admits this: "***Regarding the limitation that the composition is absent a cationic emulsion breaker; each of Augustin, column 2, lines 46-62, and Valint,***

column 9, lines 56-59 and column 10, lines 15-34 teach that cationic emulsion breaker would already be present as a component of the emulsion treated when anionic demulsifier composition is added, thus not forming part of the anionic demulsifier composition." Thus, when the anionic demulsifier composition is added, both the cationic emulsion breaker (demulsifier) and the anionic demulsifier composition are present together – a composition not contemplated or desired by the Appellant's composition which explicitly excludes the presence of a cationic emulsion breaker. Appellant's claimed composition has an absence of a cationic emulsion breaker when considered as the composition to be added (claims at issue 1-14) and when the composition is treated (claims at issue 15-18).

2. If Augustin, et al. is Relied upon, a Cationic Demulsifier is Present

At the end of page 9 of the Examiner's Answer, the Examiner concludes: "***There would be no cationic emulsion breaker added, since Bellos is only concerned with treating aqueous streams from which oil has already been primarily separated, possibly with the use of phase separation techniques employing cationic emulsion breaker***." Appellants agree that if a cationic emulsion breaker has already been used, that one would not then *again* be required. Nevertheless, in such a situation, a cationic emulsion breaker would have been used.

The Appellant respectfully submits again that if Augustin, et al. is relied upon for the subject rejection, that the presence of a cationic demulsifier must be understood – but that this presence is contradictory to the language of the pending claims which explicitly excludes a cationic emulsion breaker. Stated another way, the Appellant again respectfully submits that there is nothing of record that would teach one having ordinary skill in the art to using the anionic demulsifier of Augustin, et al. but to *omit* the cationic emulsifier. That is, as established in the Appeal Brief, there is nothing in either Bellos, et al. or Augustin, et al. that would teach such one having ordinary skill in the art to select the anionic polymer but to not also select the cationic demulsifier taught by Augustin, et al. as one of the compositions sequentially necessary. Augustin, et al. teaches that employing a cationic demulsifier is necessary followed by an anionic demulsifier, along with the inorganic demulsifiers also taught as required. The result is that both are present together.

3. Bellos, et al. Teaches the Presence of a Strong Mineral Acid, which Acid Affects the Novel and/or Basic Characteristics of the Invention

In the last sentence of the first paragraph of page 10 of the Examiner's Answer, the Examiner concludes: "There is *nothing of record* to suggest that the addition of *inorganic acid,* cationic emulsion breakers or other types of demulsifiers, or any other ingredient, would affects the novel and/or basic characteristics of the present invention concerning efficient separation of water-soluble organics from water." (Emphasis added.) Similarly, in the last sentence on page 12 of the Examiner's Answer the Examiner concludes: "If needed, regarding the 'consisting essentially of' language, again, there is *nothing of record* to suggest that the addition of *inorganic acid*, or any other ingredient, would affect the novel and/or basic characteristics of the present invention concerning efficient separation of water-soluble organics from water." (Emphasis added.)

The Appellant respectfully disagrees. What is of record not only suggests, but teaches and requires, that a strong mineral acid be present. The repeated and consistent teachings of Bellos, et al. are that a strong mineral acid is required. The Appellant would respectfully direct the Board's attention to the Abstract of Bellos, et al.:

> Oil well production fluid composed of oil and water and containing in excess of 100 ppm water soluble petroleum carboxylates in anionic form dissolved in the water is treated by acidifying the fluid to a pH of 6.0 or lower with a combination of a strong organic acid and *a strong mineral acid* and then is intimately mixed. The oil and water are separated one from the other. The content of the water soluble organics in the water is thereby substantially transferred to the oil phase. In a second aspect of the invention, water used to extract corrosive compounds to render the oil suitable for fueling gas turbine power plants is acidified to a pH of 6.0 or lower and is thereafter intimately mixed with fuel oil. (Emphasis added.)

The Board's attention is further respectfully directed to the Summary of the Invention in Bellos, et al., column 3, lines 33-40:

> First, the pH of the oil process water is adjusted to within the range of about 2 to 6, preferably in the range of 3-5 by incorporating a strong organic acid and *a strong mineral acid* therein. The strong organic acid

> is one that forms a water soluble salt with Ca^{+2}. It is preferred that *the mineral acid* have a pKa higher than that of the organic acid. In some cases, *the mineral acid* will have more than one pKa. (Emphasis added.)

The Board's attention is again respectfully directed to the following numerous locations in Bellos, et al. where a mineral acid is noted as necessary: column 4, lines 45, 56-57 and 66; column 5, lines 1 and 54-59; column 6, lines 47-48 and 52-61; column 8, lines 8-9 and 44-46; column 9, line 10; column 10, line 17; and all the claims 1-16 therein, particularly claims 1, 2 and 16 where "mineral acid" is explicitly mentioned. These will not all be reproduced herein for the sake of brevity.

As established in section VIII, B of Appellant's Appeal Brief, pages 10-12 therein, it is the Examiner's initial burden to establish a *prima facie* case of obviousness based on the references, and the Examiner has not established why one having ordinary skill in the art must omit a mineral acid when Bellos, et al. clearly teaches it. The Appellant respectfully submits that if a mineral acid does not affect the novel and/or basic characteristics the separation then Bellos, et al. would not have repeatedly and consistently recited it and required it therein. Such one having ordinary skill in the art would logically and naturally understand that such mineral acid would affect the novel and/or basic characteristics of the claimed composition *if* it were included, which it is not in the pending claims.

4. One Having Ordinary Skill in the Art does not know which of Augustin, et al.'s Demulsifiers to use in the Bellos, et al. Compositions

At the top of page 15 of the Examiner's Answer, the Examiner contends that column 7, lines 17-19 of Bellos, et al. suggests special selection of demulsifiers and/or flocculants. This portion of Bellos, et al. actually states: "Chemical oil-in-water demulsifiers and/or *special flocculants*, if needed, may be added separately or along with the feed or acid solution." (Emphasis added.) The Appellant respectfully notes that nothing is said about "selection" in this passage or why or how one demulsifier should be *selected* one over another.

The Examiner goes on at the top of page 15 of the Examiner's Answer to contend that Augustin, et al. teaches that certain specific anionic polymeric demulsifiers are "particularly preferred" from column 2, lines 14-21 thereof. The Appellant stipulates that Augustin, et al. teaches that given the requirement of anionic polymeric demulsifiers, this passage points out certain ones as preferred. However, this passage still does not address Appellant's point that one having ordinary skill in the art does not know and would not know which of Augustin, et al.'s demulsifiers to use in the Bellos, et al. compositions since Augustin, et al. teaches many types of demulsifiers of which anionic demulsifiers are one. That is, this passage the Examiner quotes does not prefer anionic polymer demulsifiers over the other demulsifiers taught by the reference taken as a whole.

The Examiner concludes this paragraph on page 15 of the Examiner's Answer by stating: "Hence, it is conjectured that Bellos in view of Augustin and Valint would incorporate a non-anionic demulsifier (ex. inorganic demulsifier) with organic acid (AHA) in an earlier stage and an anionic polymeric demulsifier with organic acid in a later stage of treatment." However, the Appellant respectfully submits that the Examiner need not conjecture this conclusion since Augustin, et al. in fact explicitly teaches that the non-anionic demulsifier used in the earlier stage is a *cationic* demulsifier that would still be present in the later stage when an anionic polymeric demulsifier is used – which cationic demulsifier is explicitly excluded by the claims herein.

Further, in the middle of the paragraph on page 16 of the Examiner's Answer, the Examiner again invokes column 2, lines 14-21 of Augustin, et al. as a supposed teaching of the preference of an anionic polymer. The Appellant must respectfully traverse. This portion states:

> The organic anionic demulsifiers used are preferably the known anionic polymers based on acrylamide/(meth)acrylic acid or acrylic ester/(meth)acrylic acid copolymers. Particular preference is given to the copolymers having a high molecular weight (MG >0.8 million) and average ionic character (i.e. the (meth)acrylic acid content of the copolymers being about 30 to 50% by weight)

However, all that this paragraph teaches is that when selecting the organic anionic demulsifiers, these are the preferred ones, not that the anionic demulsi-

fiers are preferred over the cationic demulsifiers. In fact, a corresponding paragraph for the cationic demulsifiers immediately follows at lines 22-34 of column 2:

> The organic *cationic* demulsifiers used are *preferably* synthetic polymers based on polyamines, polyimines, polyether-polyamines, polyamines and polyamideamines or quaternized polyamines and quaternized polyamideamines, and also *cationic* copolymers made from acrylamide and different proportions of cationic monomers or oligomers, and homopolymers of dimethyldiallylammonium chloride (cf., for example, Kirk Othmer, Encyclopedia of Chemical Technology, 3rd Ed., Vol. 10, p. 489 et seq.). Organic *cationic* demulsifiers based on polyamines, polyimines, polyether-polyamines and polyamideamines have proved *particularly suitable*. (Emphasis added.)

The Appellants thus respectfully submit that there is still no reason for one having ordinary skill in the art to select the anionic demulsifiers from Augustin, et al. for a supposed composition with an AHA of Bellos, et al. from amongst the other demulsifiers taught by Augustin, et al., and that thus a *prima facie* case of obviousness has not been made.

At the end of page 17 of the Examiner's Answer, the Examiner concludes that: "Bellos is solely relied upon for the combination of AHA and demulsifier, Augustin and Valint are only needed to specify type of demulsifying agent employed." However, it is the Appellant's point, as established above in this section, that neither Augustin, et al. nor Valint do specify what type of demulsifying agent, among the many taught therein and elsewhere in the art, should be the demulsifier. Appellant again asks where in the art is one having ordinary skill in the art to know which demulsifier to use, and to have an expectation that the resulting composition would be successful?

CONCLUSION

With regard to the Examiner's arguments not explicitly addressed herein in this Reply Brief, the Appellant is of the position that Appellant's arguments made in the Brief on Appeal filed September 13, 2007, on those points are sufficient to overcome the rejection and the Board's attention is respectfully directed thereto. In the interest of brevity, they will not be repeated herein.

It is respectfully submitted that the rejections of the claims have been overcome and/or avoided by the arguments presented above. Specifically, it has been established that a *prima facie* 35 U.S.C. §103 rejection has not been made. It is again respectfully requested that the Board reverse the final rejection of the Examiner and that the application be advanced to allowance and issue. The Examiner and/or the Board are encouraged to call the Appellant's attorney at the number below for any reason that may advance prosecution of the case.

Respectfully submitted,
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SUBSTITUTE APPENDIX A – CLAIMS ON APPEAL

1. (previously presented): A composition for removing solubilized organics from a water-like fluid phase consisting essentially of:

a hydrophilic α-hydroxymonocarboxylic acid (AHA); and

an anionic polymer,

in the absence of a cationic emulsion breaker,

where the weight ratio of AHA to anionic polymer in the composition ranges from over 50:1 to 10,000 to 1.

2. (original): The composition of claim 1 where the AHA has a pK_a of greater than 3.8.

3. (original): The composition of claim 1 where the AHA has the structure RR'C(OH)COOH where

R and R' are independently selected from the group consisting of hydrogen and nonacidic hydrocarbonaceous groups,

with the proviso that

$$n^H + 0.5(n^C) - 7(n^O) < 15(n^{OH})$$

where n^H = the total number of hydrogens on carbons,

n^C = the total number of carbons,

n^O = the total number of oxygens not attached to hydrogens, and

n^{OH} = the total number of –OH groups in the molecule.

4. (original): The composition of claim 1 where the anionic polymer is selected from the group consisting of poly(acrylic acid) and poly(methacrylic acid) and salts thereof, poly(acroyl sulfonic acid) and poly(vinyl sulfonic acid) and salts thereof, and copolymers of the aforementioned polymers with acrylic amides and esters, and mixtures thereof.

5. (canceled)

6. (original): The composition of claim 1 where the anionic polymer has a degree of polymerization between 3000 and 300,000.

7. (previously presented): The composition of claim 3 where the anionic polymer is selected from the group consisting of poly(acrylic acid) and poly(methacrylic acid) and salts thereof, poly(acroyl sulfonic acid) and poly(vinyl sulfonic acid) and salts thereof, and copolymers of the aforementioned polymers with acrylic amides and esters, and mixtures thereof.

8-9. (canceled)

10. (previously presented): A composition for removing solubilized organics from a water-like fluid phase consisting essentially of:

a hydrophilic α-hydroxymonocarboxylic acid (AHA) having a degree of polymerization of above 30; and

an anionic polymer,

in the absence of a cationic emulsion breaker,

where the weight ratio of AHA to anionic polymer in the composition ranges from over 50:1 to 10,000 to 1.

11. (original): The composition of claim 10 where the AHA has a pK_a of greater than 3.8.

12. (original): The composition of claim 10 where the AHA has the structure RR'C(OH)COOH where

R and R' are independently selected from the group consisting of hydrogen and nonacidic hydrocarbonaceous groups,

with the proviso that

$$n^H + 0.5(n^C) - 7(n^O) < 15(n^{OH})$$

where n^H = the total number of hydrogens on carbons,

n^C = the total number of carbons,

n^O = the total number of oxygens not attached to hydrogens, and

n^{OH} = the total number of –OH groups in the molecule.

13. (original): The composition of claim 10 where the anionic polymer is selected from the group consisting of poly(acrylic acid) and poly(methacrylic acid) and salts thereof, poly(acroyl sulfonic acid) and poly(vinyl sulfonic acid) and salts thereof, and copolymers of the aforementioned polymers with acrylic amides and esters, and mixtures thereof.

14. (original): The composition of claim 10 where the anionic polymer has a degree of polymerization between 3000 and 300,000.

15. (previously presented): A composition comprising:

a water-like fluid phase;

at least one solubilized organic in the water-like fluid phase; and

a composition for removing solubilized organics from a water-like fluid phase consisting essentially of:

an anionic polymer; and

a hydrophilic α-hydroxymonocarboxylic acid (AHA),

in the absence of a cationic emulsion breaker,

where the weight ratio of AHA to anionic polymer in the composition ranges from over 50:1 to 10,000 to 1.

16. (original): The composition of claim 15 where the AHA has a pK_a of greater than 3.8.

17. (original): The composition of claim 15 where the AHA has the structure RR'C(OH)COOH where

R and R' are independently selected from the group consisting of hydrogen and nonacidic hydrocarbonaceous groups,

with the proviso that

$$n^H + 0.5(n^C) - 7(n^O) < 15(n^{OH})$$

where n^H = the total number of hydrogens on carbons,
n^C = the total number of carbons,
n^O = the total number of oxygens not attached to hydrogens, and
n^{OH} = the total number of –OH groups in the molecule.

18. (original): The composition of claim 15 where the anionic polymer is selected from the group consisting of poly(acrylic acid) and poly(methacrylic acid) and salts thereof, poly(acroyl sulfonic acid) and poly(vinyl sulfonic acid) and salts thereof, and copolymers of the aforementioned polymers with acrylic amides and esters, and mixtures thereof.